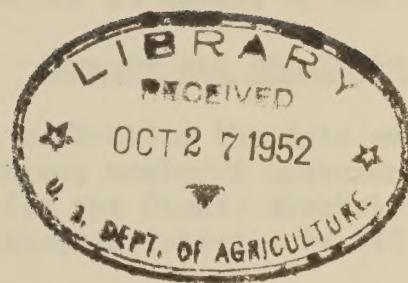


3
POWER REQUIREMENT STUDY,
OCONTO ELECTRIC COOPERATIVE
(WISCONSIN 14 OCONTO)//



Prepared by
Program Analyst
Office of the Administrator
U.S. RURAL ELECTRIFICATION ADMINISTRATION
July 1952

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POWER REQUIREMENT STUDY 1/

WISCONSIN 14 OCONTOForeword

This study has been prepared by the Rural Electrification Administration for use in determining the present and estimated future power requirements of the Oconto Electric Cooperative (Wisconsin 14 Oconto).

The estimates of future loads contained in the study have been arrived at from a field survey in the Cooperative's area and from basic data obtained in the Cooperative's office. The estimates of kwh consumption for farm, nonfarm and town residential consumers used herein are based upon a projection of historical trends in consumption, type of farm, income, competitive sources of energy, and other economic factors which are believed to have a bearing on the future use of electricity in this area.

The estimates of average unit kilowatt demands per consumer at peak load, corresponding to the estimated average kilowatt-hour consumption per member per month of farm, nonfarm and small commercial consumers, have been derived from the curve "Maximum Demand at Substation" accompanying Engineering Memorandum No. 94R5 of the Engineering Division, REA, dated August 21, 1950. The total number of consumers to be served in each substation area, rather than the number of consumers in a particular class, was used as a basis in arriving at the total and unit demands in order to reflect the probable overall diversity between classes of consumers in a given substation area. No adjustment for a power factor less than unity was applied, it being assumed for estimating purposes that the KVA demand as read from the curve was equal to the KW demand at the substation.

Summary and Conclusions

Pertinent information reflecting the data and conclusions arrived at regarding the present and future number of consumers, kilowatt-hour requirements, and kilowatt demands for the Oconto Electric Cooperative (Wisconsin 14 Oconto) are included in the attached Tables I to VII, inclusive.

Table VII (Summary of Power Requirements) indicates that approximately 3,143 consumers will be served by the Cooperative in 1954, 3,298 in 1957, and 3,588 in 1962, at an estimated maximum demand at substation of 3,191 kilowatts in 1954, 4,038 kilowatts in 1957, and 5,456 kilowatts in 1962. Likewise, it is estimated that the Cooperative's annual energy requirements at substations will approximate 11.8 million kilowatt-hours in 1954, 15.2 million kilowatt-hours in 1957, and 20.8 million kilowatt-hours in 1962.

1/ Based on a office study compiled by data received from the Cooperative. Analyzed by K. O. Peters, Office of the Administrator, REA, USDA.

The degree of attainment of area coverage by the Cooperative, as well as the achievement of the estimated kilowatt-hour consumption foreseen in this report, are contingent on the following important considerations:

1. An adequate, dependable source of low-cost power supply.
2. Dependable, adequate electrical power to the ultimate consumer with a minimum of interruption in service and at the lowest retail rate commensurate with "pay out" considerations.
3. A fully prosecuted power use program designed to attain the goals of saturation of appliances and farm equipment reflected by the estimates included in this report.

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E. C. Weitzell,
Program Analyst

TABLE I

COMPARATIVE ANNUAL OPERATING DATA ON CONSUMERS AND AVERAGE MONTHLY CONSUMPTION

WISCONSIN & OCONTO

FIVE MONTHS TO MAY 31, 1952

PROGRAM ANALYST, OFFICE OF THE
ADMINISTRATOR: FEA - JULY 1952

TABLE I (CONT'D.)

COMPARATIVE ANNUAL OPERATING DATA ON CONSUMERS AND AVERAGE MONTHLY CONSUMPTION

WISCONSIN 14 OCONTO		SEASONAL			STREET LIGHTING			OTHER			PUB. BLDGS.			TOTAL	
YEAR	MEMBERS	MEMBERS	AVERAGE	MEMBERS	MEMBERS	AVERAGE	NO.	KWH/MD.	% INCR.	NO.	KWH/MD.	% INCR.	NO.	KWH/MD.	% INCR.
1941													1,033	69	—
1942													1,213	74	7.2
1943													1,267	82	10.8
1944													1,416	87	6.1
1945													1,671	94	8.0
1946													1,863	112	19.1
1947													2,069	135	20.5
1948													2,210	151	11.9
1949													2,294	178	17.9
1950	192	59	—	3	45	45.2	118	50	100.0				2,430	195	9.6
1951	206	49	-16.9	3	40	-11.1							69	52	2,471
1952 *	—	—	—	3	42	—							67	73	2,410
SUM OF YEARLY % INCR.													119.0		
(1941 - 1951)													135.2		
AVERAGE PER YEAR													59.9		13.5

* FIVE MONTHS TO MAY 31, 1952.

PROGRAM ANALYST, OFFICE OF THE
ADMINISTRATOR, REA - JULY 1952

TABLE II

COMPARATIVE ANNUAL OPERATING DATA ON ENERGY REQUIREMENTS

YEAR	ENERGY PURCHASED		ENERGY SOLD		ENERGY LOSSES		MAXIMUM KW DEMAND	TOTAL SERVICES CONNECTED	TOTAL MILES ENERGIZED	OVERALL CONSUMER DENSITY	AVERAGE COST PER KWH
	KWH	\$ INCR.	KWH	% INCR.	KWH	% LOSS					
1941	1,072,280	...	857,891	...	214,449	20.0	434	1,089	425	2.40	.01211
1942	1,360,800	26.9	1,083,913	26.4	276,887	20.3	499	1,207	435	2.77	.01164
1943	1,564,000	14.9	1,248,980	15.2	315,020	20.1	576	1,404	442	3.18	.01143
1944	1,810,400	15.8	1,478,621	18.4	331,779	18.3	730	1,618	480	3.37	.01121
1945	2,330,400	28.7	1,876,226	26.9	454,174	19.5	941	1,865	528	3.53	.01091
1946	3,043,600	30.6	2,495,321	33.0	548,279	18.0	*	2,087	571	3.65	.01068
1947	3,865,800	27.0	3,170,510	27.1	695,290	18.0	*	2,284	600	3.81	.01140
1948	4,959,000	28.3	4,012,545	26.6	946,455	19.1	1,987	2,311	630	3.67	.01261
1949 ***	6,139,500	29.8	4,893,168	21.9	1,248,332	20.9	*	2,438	666	3.66	.00967
1950	7,273,114	18.5	5,677,921	16.1	1,595,193	21.9	2,498	2,532	698	3.63	.00740
1951	8,624,300	18.6	7,159,178	26.1	1,465,122	17.0	2,872	2,584	706	3.66	.00633
1952 **	9,920,900	...	9,281,234	...	539,566	13.8	...	2,616	717	3.65	.00518
SUM OF YEARLY % INCR. (1941 - 1951)	233.1	237.7
AVERAGE PER YEAR	23.3	23.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8

* NOT AVAILABLE.

** FIVE MONTHS ENDING MAY 31, 1952.
*** HYDRO PLANT PLACED IN OPERATION (1000KWH).

TABLE III

ESTIMATE OF LOADS - OCONTO FALLS AND STILES HYDRO PLANT SUBSTATION AREA

WISCONSIN 14 OCONTO

TYPE OF CONSUMER	NUMBER OF CONSUMERS		KW DEMAND				ANNUAL kWh REQUIREMENTS		
	1954	1957	1954	1957	1962	1954	1957	1962	1962
FARM	1,280	1,298	1,226	1,425	1,776	① 1,368 ② 1,113	① 1,791 ② 1,113	③ 3600 4,608,000	④ 45,000 5,841,000
NONFARM (RES.)	82	89	113	13	15	① 0,165 ② 0,045	③ 0,265 ④ 0,232	⑤ 3000 129	⑥ 420 151
SMALL COMMERCIAL	50	58	59	102	129	⑦ 2,554 ⑧ 0,350	⑨ 0,436 ⑩ 1,079	⑪ 345,000 ⑫ 19	⑬ 7560 ⑭ 780
PUBLIC BUILDINGS	41	42	43	12	15	⑮ 0,286 ⑯ 0,079	⑰ 1,249 ⑱ 0,393	⑲ 31,980 ⑳ 80	⑳ 960 ⑳ 2820
TOWN (RES.)	38	42	64	34	45	⑳ 0,307 ⑳ 0,393	⑳ 0,503 ⑳ 0,503	⑳ 107,160 ⑳ 112	⑳ 3480 ⑳ 840
SEASONAL	180	193	223	55	76	⑳ 25/1•10F ⑳ 25/1•10F	⑳ 25/1•10F ⑳ 25/1•10F	⑳ 151,200 ⑳ 600	⑳ 1080 ⑳ 600
STREET LIGHTING	5	5	5	1	1	⑳ 25/1•10F ⑳ 25/1•10F	⑳ 25/1•10F ⑳ 25/1•10F	⑳ 2,000 ⑳ 1	⑳ 600 ⑳ 600
LARGE COMMERCIAL:						⑳ 37.5/1•5DF ⑳ 37.5/1•5DF	⑳ 37.5/1•5DF ⑳ 37.5/1•5DF	⑳ 40,000 ⑳ 25	⑳ 42,000 ⑳ 42,000
THOME DAIRY PLANT	1	1	1	1	25	⑳ 18/1•2DF ⑳ 18/1•2DF	⑳ 18/1•2DF ⑳ 18/1•2DF	⑳ 40,000 ⑳ 15	⑳ 50,000 ⑳ 35,000
ALAMO SUPPER CLUB	1	1	1	1	15	⑳ 15/1•5DF ⑳ 15/1•5DF	⑳ 15/1•5DF ⑳ 15/1•5DF	⑳ 35,000 ⑳ 10	⑳ 35,000 ⑳ 20,000
SCHROEDER FLORAL CO.	1	1	1	1	10	⑳ 20,000 ⑳ 10	⑳ 20,000 ⑳ 10	⑳ 20,000 ⑳ 10	⑳ 20,000 ⑳ 10
SUB-TOTAL	1,679	1,730	1,836	1,692	2,107	2,818	5,362,940	6,811,780	9,292,500

NOTE: CONTINUED ON NEXT PAGE.

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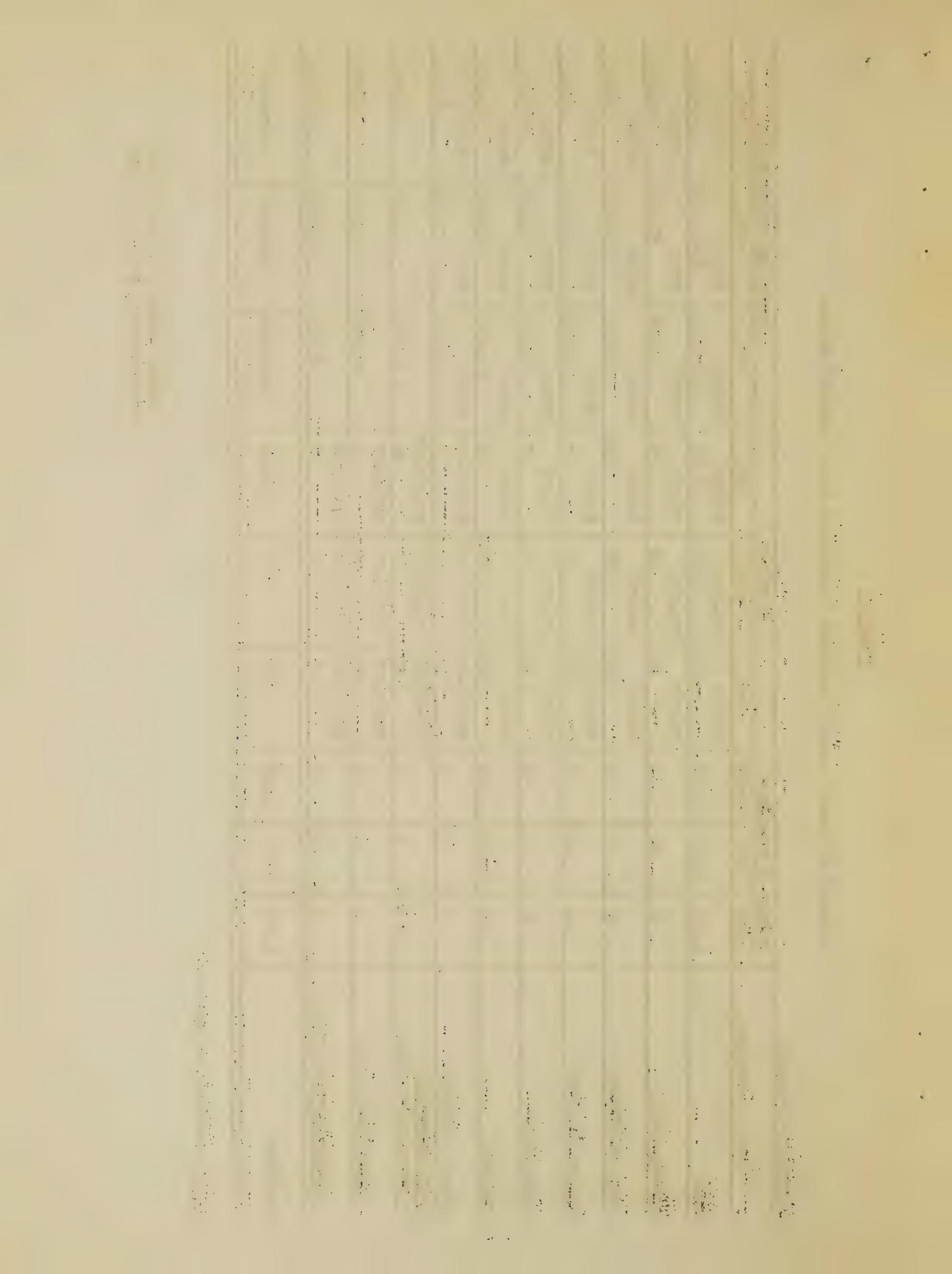


TABLE III (CONT'D.)

ESTIMATE OF LOADS - OCONTO FALLS AND STILES HYDRO PLANT SUBSTATION AREA

TYPE OF CONSUMER	NUMBER OF CONSUMERS			KW DEMAND			ANNUAL KWH REQUIREMENTS		
	1954	1957	1962	1954	1957	1962	1954	1957	1962
BROUGHT FORWARD	1,679	1,730	1,836	1,692	2,107	2,818	5,362,940	6,811,780	9,292,500
LARGE COMMERCIAL (CONT'D.)				@10/2.0DF	@10/2.0DF	@10/2.0DF			
ORNAMENTAL IRON & WELDING SHOP	1	1	1	5	5	5	5,000	5,000	5,000
BARCONE TAVERN	1	1	1	@10/1.2DF	@10/1.2DF	@10/1.2DF			
BIERSTEKER TAVERN	1	1	1	@12/1.2DF	@12/1.2DF	@12/1.2DF			
REGAL FUR FARM	1	1	1	@40/2.0DF	@40/2.0DF	@40/2.0DF			
MURPHY FROZEN FOOD LOCKER	1	1	1	@15/1.5DF	@15/1.5DF	@15/1.5DF			
LARGE COMMERCIAL (POTENTIAL)	—	3	5	---	30	50	—	45,000	75,000
SUB-TOTAL							5,446,940	6,940,780	9,451,500
PLUS DIST. LOSSES (APPROX.)							@18%	@17%	@17%
TOTAL	1,684	1,738	1,846	1,745	2,190	2,921	6,643,000	8,464,000	11,387,000
ANNUAL LOAD FACTOR -							43.5%	44.1%	44.5%

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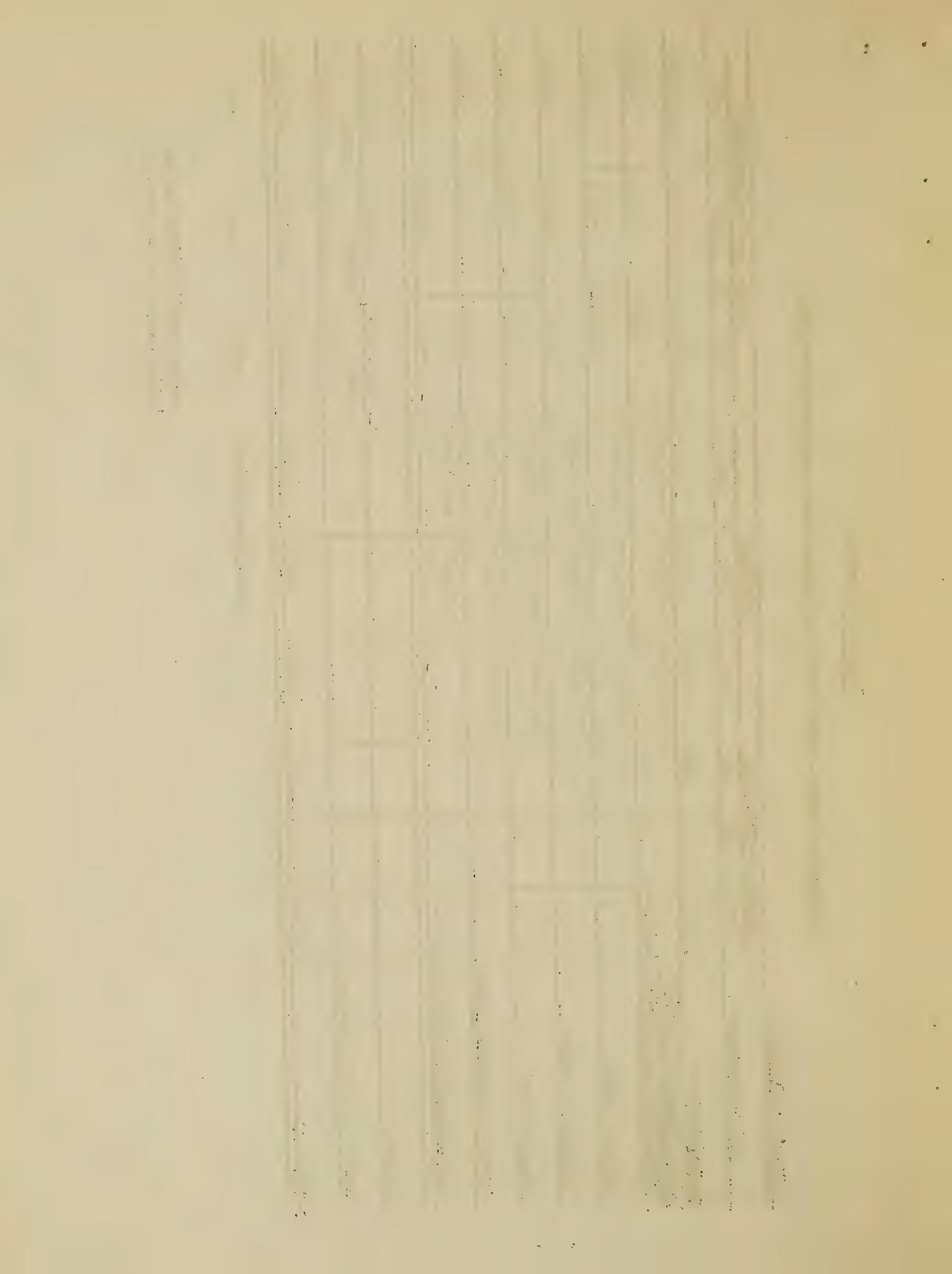


TABLE IV

ESTIMATE OF LOADS - COLEMAN SUBSTATION AREA

WISCONSIN 14 OCONTO		NUMBER OF CONSUMERS		KW DEMAND		ANNUAL KWH REQUIREMENTS	
TYPE OF CONSUMER		1954	1957	1962	1954	1957	1962
FARM		600	617	641	61.136	61.95	61.828
NONFARM (RES.)		40	44	60	60.155	60.169	60.270
SMALL COMMERCIAL		26	32	35	62.087	62.277	62.606
PUBLIC BUILDINGS		14	15	16	60.292	60.357	60.445
TOWN (RES.)		22	28	36	60.912	61.101	61.274
SEASONAL		210	240	284	60.314	60.401	60.514
STREET LIGHTING		2	2	2	60.11D	60.25/1.10DF	60.25/1.10DF
LARGE COMMERCIAL:					60.15/1.5DF	60.15/1.5DF	60.15/1.5DF
RUDOLPH DAIRY PLANT		1	1	1	60.20DF	60.20DF	60.20DF
GRAETZ MACHINE SHOP		1	1	1	60.15DF	60.15DF	60.15DF
JOHNSON FROZEN FOOD LOCKER PLANT		1	1	1	60.15DF	60.15DF	60.15DF
TAVERN (LLOYD MALBES)		1	1	1	60.12/1.2DF	60.12/1.2DF	60.12/1.2DF
LARGE COMMERCIAL (POTENTIAL)		1	2	3	60.15DF	60.15DF	60.15DF
SUB-TOTAL		919	984	1,081	1,156	1,271	1,317,000
PLUS DIST. LOSSES (APPROX.)					118%	118%	117%
TOTAL		919	984	1,081	905	1,156	1,271
ANNUAL LOAD FACTOR -							41.8%
							42.7%
							43.1%

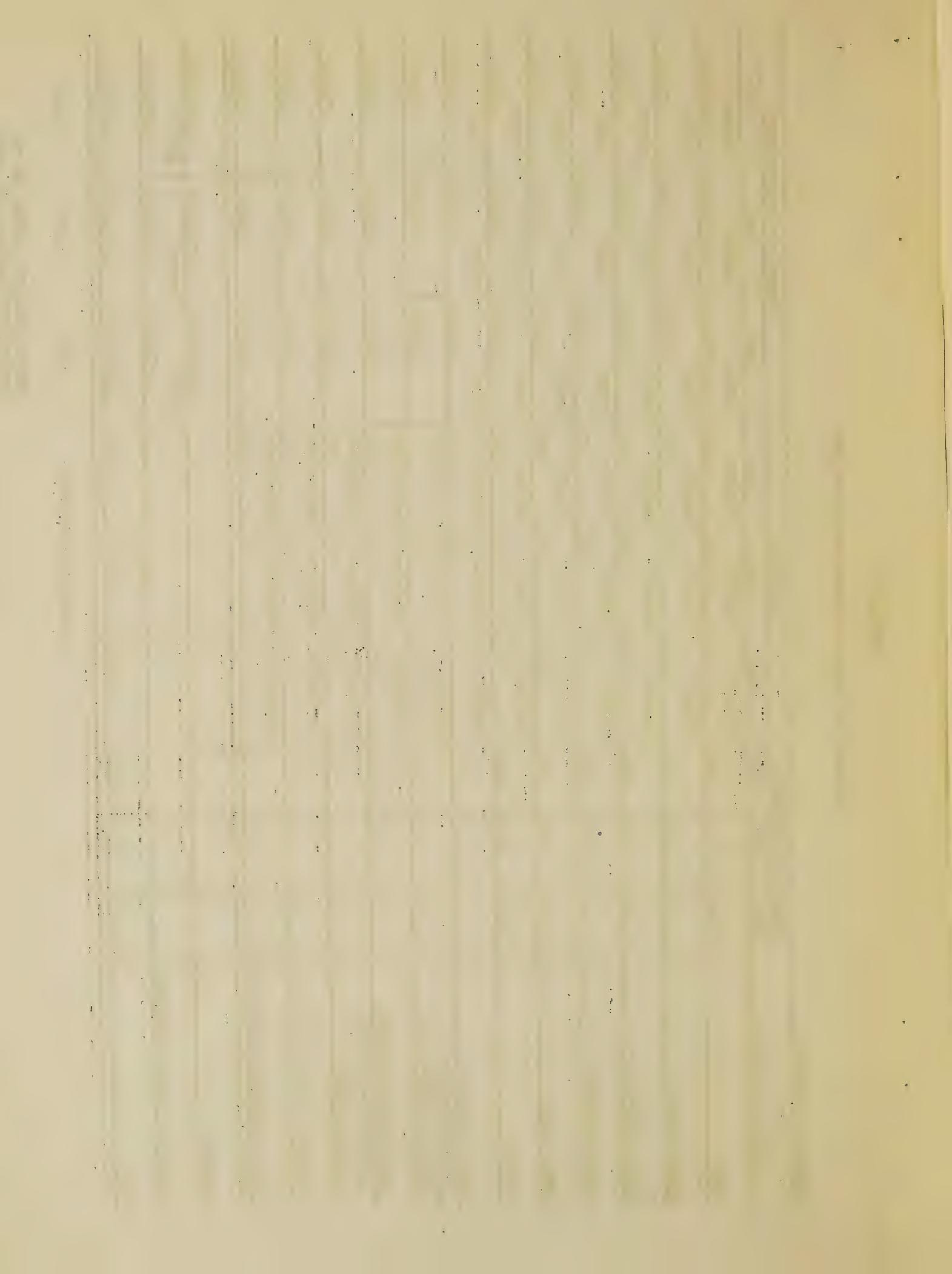


TABLE V

ESTIMATE OF LOADS - UNDERHILL SUBSTATION AREA

WISCONSIN 14 OCTO

TYPE OF CONSUMER	NUMBER OF CONSUMERS			KW DEMAND			ANNUAL kWh REQUIREMENTS		
	1954	1957	1962	1954	1957	1962	1954	1957	1962
FARM	320	220	348	@1.082	@1.0424	@1.0865	@3600	@4500	@6000
NONFARM (RES.)	46	50	65	@0.160	78	470	1,152,000	1,485,000	2,088,000
SMALL COMMERCIAL	24	29	31	@2.173	@0.175	@0.276	@300	@420	@720
PUBLIC BUILDINGS	12	13	14	@0.304	@0.365	@2.659	@6900	@7560	@8700
TOWN (RES.)	21	25	43	@0.949	@1.124	@1.300	165,600	219,240	269,700
SEASONAL	110	120	150	@0.327	@0.409	@0.524	@840	@960	@1200
STREET LIGHTING	3	3	3	0.25/1.0IDF	0.25/1.0IDF	0.25/1.0IDF	92,400	129,600	168,000
LARGE COMMERCIAL:				@15/1.02DF	@15/1.02DF	@15/1.02DF	1,800	1,800	1,800
CHAMBERS SUPPER CLUB	1	1	1	13	13	13	25,000	25,000	25,000
LARGE COMMERCIAL (POTENTIAL)	3	5	6	@15/1.5DF	@15/1.5DF	@15/1.5DF	45,000	75,000	90,000
SUB-TOTAL							1,564,180	2,056,120	2,929,540
PLUS DIST. LOSSES (APPROX.)							@18% 343,820	@18% 450,880	@17% 600,460
TOTAL	540	576	661	541	692	964	1,908,000	2,507,000	3,530,000

ANNUAL LOAD FACTOR = 40.3% **41.4%** **41.8%**

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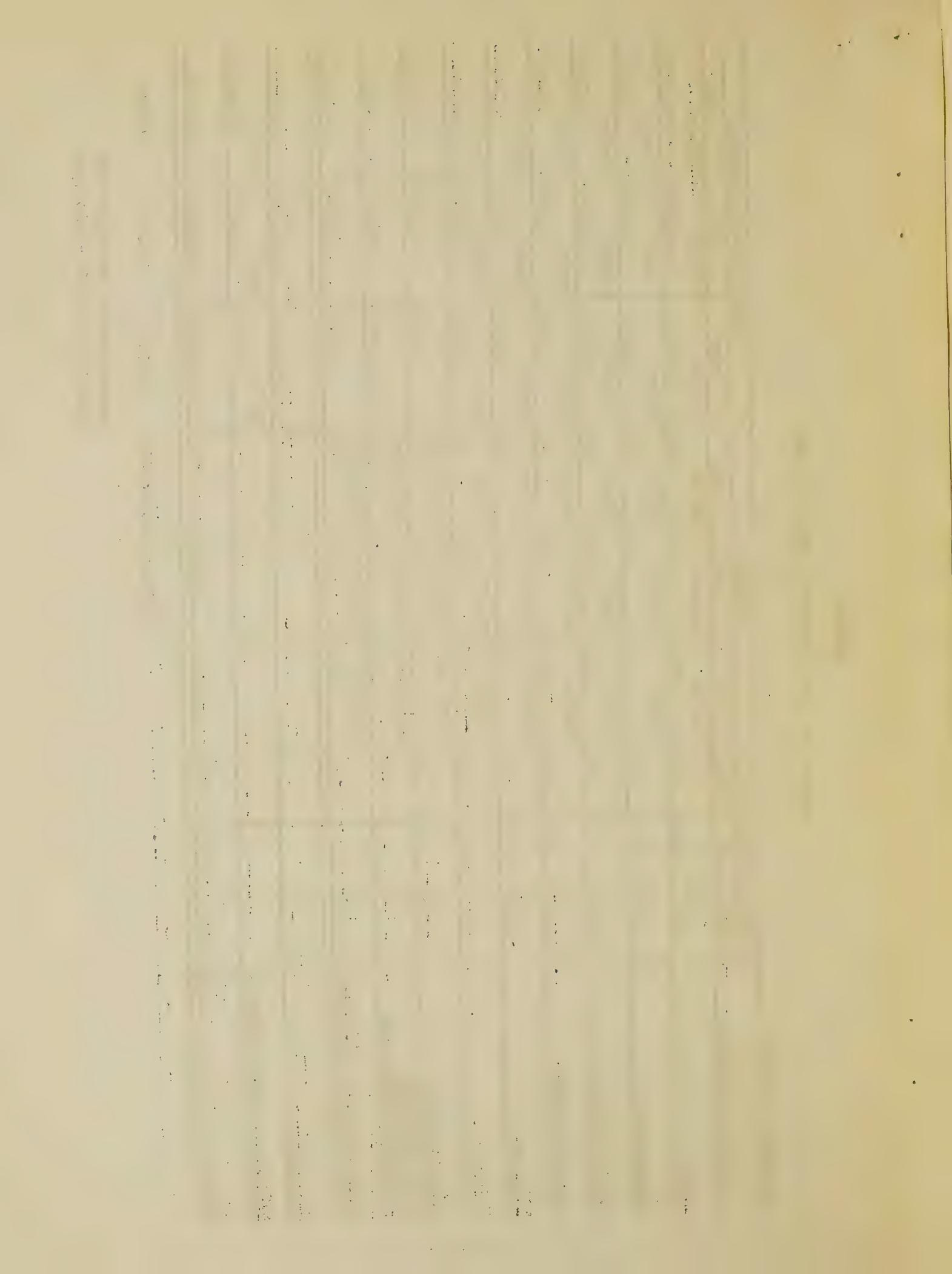


TABLE VI

**ESTIMATE OF LOADS - SUMMARY OF POWER REQUIREMENTS
(BY CLASSIFICATION OF CONSUMERS)**

TYPE OF CONSUMER	NUMBER OF CONSUMERS		KW DEMAND			ANNUAL kWh REQUIREMENTS		
	1954	1957	1954	1957	1962	1954	1957	1962
FARM	2,200	2,245	2,315	2,485	3,107	4,196	7,920,000	10,102,500
NONFARM (RES.)	168	183	238	26	31	64	47,400	76,860
SMALL COMMERCIAL	100	119	125	208	269	324	689,600	899,640
PUBLIC BUILDINGS	67	70	73	20	25	32	52,260	67,200
TOWNS (RES.)	81	95	143	74	104	182	228,420	330,600
SEASONAL	500	553	657	157	221	337	420,000	597,240
STREET LIGHTING	10	10	10	3	3	3	6,000	6,000
LARGE COMMERCIAL (EXISTING)	13	13	13	178	178	178	307,000	312,000
LARGE COMMERCIAL (POTENTIAL)	4	10	14	40	100	140	60,000	150,000
SUB-TOTAL							9,730,680	12,542,040
PLUS DIST. LOSSES (APPROX.)							2,137,320	2,751,960
TOTAL	3,143	3,298	3,588	3,191	4,038	5,456	11,868,000	15,294,000
								210,000
								20,848,000

TABLE VII
ESTIMATE OF LOADS - SUMMARY OF POWER REQUIREMENTS
(BY SUBSTATIONS)

SUBSTATION AREAS	NUMBER OF CONSUMERS		KWH DEMAND		ANNUAL KWH REQUIREMENTS	
	1954	1957	1952	1957	1954	1957
OCONTO FALLS AND STILES HYDRO PLANT	1,684	1,738	1,846	1,745	2,190	2,921
COLEMAN	919	984	1,081	905	1,156	1,571
UNDERHILL	540	576	661	541	692	964
TOTAL	3,143	3,298	3,588	3,191	4,038	5,456
ANNUAL LOAD FACTOR -					42.4%	43.2%
					43.6%	43.6%

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